

REMARKS

Claims 1-49 are pending in this application. Claims 16-22, 24-27, 29, 30, and 34-49 have been canceled. Claims 11, 23, 28, and 31-33 have been amended and new claims 50-65. Accordingly, upon entry of the amendments presented herein, claims 1-15, 23, 28, and 31-33 will remain pending in the application.

Support for the amendments to the claims may be found throughout the specification and claims as originally filed. Specifically, support for the amendments to claims 1 and 2 and new claims 50-65 may be found at, for example, page 3, lines 8-25, page 5, lines 4-22, page 12, line 18, through page 13, line 2, and Figures 1 and 2 of the specification. *No new matter has been added.*

Any amendments to and/or cancellation of the claims was done solely to more particularly point out and distinctly claim the subject matter of Applicants' invention in order to expedite the prosecution of the application. Applicants reserve the right to pursue the claims as originally filed in this or a separate application(s).

Election/Restriction

The Examiner has required restriction of the invention under 35 U.S.C. § 121 to one of the following groups:

1. Claims 1-15, drawn to a process for enhanced production of pantothenate comprising culturing a microorganism having a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway.
2. Claims 16-22, drawn to a process for enhanced production of pantothenate comprising culturing a microorganism having a deregulated pantothenate biosynthetic pathway, a deregulated isoleucine-valine (ilv) biosynthetic pathway, and a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway.
3. Claim 29, drawn to a process for producing pantothenate comprising culturing a microorganism having a deregulated pantothenate biosynthetic pathway under excess serine.
4. Claims 34, 35, drawn to a composition comprising pantothenate.
5. Claims 36-41, drawn to a recombinant microorganism for the enhanced production of pantothenate, said microorganism having a deregulated

pantothenate biosynthetic pathway, and a deregulated methylenetetrahydrofolate biosynthetic pathway.

6. Claims 42, 43, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, and at least one deregulated isoleucine-valine (*ilv*) biosynthetic enzyme-encoding gene.
7. Claim 44, drawn to a process for producing pantothenate comprising culturing a microorganism having a deregulated *panB* gene, a deregulated *panD* gene under conditions of excess serine.
8. Claim 45, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, and a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway under conditions of excess valine.
9. Claim 46, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, and a deregulated *glyA* gene under conditions of excess valine.
10. Claim 47, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, and a mutated, deleted, or disrupted *purR* gene under conditions of excess valine.
11. Claim 48, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, and a deregulated *serA* gene under conditions of excess valine.
12. Claim 49, drawn to a process for producing pantothenate comprising culturing a recombinant microorganism having a deregulated *panB* gene, a deregulated *panD* gene, a deregulated *serA* gene, and a deregulated *glyA* gene under conditions of excess valine.

Applicants hereby elect, **Group I, claims 1-15**, directed to process for enhanced production of pantothenate comprising culturing a microorganism having a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway, without traverse.

Notwithstanding the foregoing election, Applicants respectfully submit that Inventions 1, 2, 4-6, and 8-12 are directed to a single inventive concept, this concept being a means of culturing a micororgansim having a deregulated MTF biosynthetic pathway for the production of pantothenate. Therefore, Applicant submits that the compositions of Inventions 4 and 5 and the methods of Inventions 2, 6, and 8-12 are integrally related to the methods of Invention 1. As such, Inventions 1, 2, 4-6, and 8-12 should be rejoined with Group I. As the M.P.E.P. states:

[i]f the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions. M.P.E.P. § 803.

Inventions 1, 2, 4-6, and 8-12 all relate to means to enhance production of pantothenate by culturing a microorganism having a deregulated MTF biosynthetic pathway. As such the searches with regard to these inventions would be co-extensive and would not involve a serious burden on the Examiner.

Furthermore, with respect to the Examiner's assertion that the claims lack novelty as being anticipated by Sahm, *et al.* (*Appl. Environ. Microbiol.* (1999) 65:1973), Applicants respectfully submit that Sahm, *et al.* fail to teach or suggest the instant invention for the following reasons.

Claim 1, and claims dependent therefrom, are directed to processes for the enhanced production of pantothenate, comprising culturing ***a microorganism having a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway***, under conditions such that pantothenate production is enhanced. Claim 2, and claims dependent therefrom, are directed to processes for the enhanced production of pantothenate, comprising culturing ***a microorganism having a deregulated pantothenate biosynthetic pathway, and a deregulated methylenetetrahydrofolate (MTF) biosynthetic pathway***, under conditions such that pantothenate production is enhanced.

In contrast, Sahm, *et al.* teach the isolation and cloning of *panB* and *panC* from *C. glutamicum* and methods for the production of pantothenate by overexpression of these genes in combination with an overexpressed *ilvBNCD* operon and a deleted *ilvA* gene. However, Sahm, *et al.* fail to teach or suggest that manipulation of the ***methylenetetrahydrofolate (MTF) biosynthetic pathway results in enhanced production of pantothenate***.

Accordingly, Sahm, *et al.* fail to teach or suggest the claimed invention and, thus, the claims are novel and inventive over Sahm, *et al.*

Applicants reserve the right to traverse the above restriction with respect to the non-elected Groups in this or subsequent applications.

SUMMARY

If a telephone conversation with Applicant's Attorney would expedite the prosecution of the above-identified application, the examiner is urged to call the undersigned at (617) 227-7400.

An extension of time has been filed herewith. If additional fees are due, please charge our Deposit Account No. 12-0080, under Order No. BGI-154US2, from which the undersigned is authorized to draw.

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Respectfully submitted,

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